



SEQUENCE LISTING

(1) GENERAL INFORMATION:

- (i) APPLICANT: WOLPE, STEPHEN D.
TSYRLOVA, IRENA
- (ii) TITLE OF INVENTION: INHIBITOR AND STIMULATOR OF STEM CELL PROLIFERATION
AND USES THEREOF
- (iii) NUMBER OF SEQUENCES: 39
- (iv) CORRESPONDENCE ADDRESS:
 - (A) ADDRESSEE: NIXON & VANDERHYE P.C.
 - (B) STREET: 901 NORTH GLEBE ROAD
 - (C) CITY: ARLINGTON
 - (D) STATE: VIRGINIA
 - (E) COUNTRY: U.S.A.
 - (F) ZIP: 22203-1808
- (v) COMPUTER READABLE FORM:
 - (A) MEDIUM TYPE: 1.44 Mb disk
 - (B) COMPUTER: IBM PC compatible
 - (C) OPERATING SYSTEM: PC-DOS/MS-DOS
 - (D) SOFTWARE: MS Word
- (vi) CURRENT APPLICATION DATA:
 - (A) APPLICATION NUMBER: US 10/776,172
 - (B) FILING DATE: 12-FEB-2004
 - (C) CLASSIFICATION:
- (vii) PRIOR APPLICATION DATA:
 - (A) APPLICATION NUMBER: US 08/832,443
 - (B) FILING DATE: 03-APR-1997
- (vii) PRIOR APPLICATION DATA:
 - (A) APPLICATION NUMBER: US 08/627,173
 - (B) FILING DATE: 03-APR-1996

(2) INFORMATION FOR SEQ ID NO:1:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 13 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS:
 - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: peptide
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

Phe	Pro	His	Phe	Asp	Leu	Ser	His	Gly	Ser	Ala	Gln	Val
1				5							10	

(2) INFORMATION FOR SEQ ID NO:2:

- (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 15 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

Cys	Phe	Pro	His	Phe	Asp	Leu	Ser	His	Gly	Ser	Ala	Gln	Val	Cys
1				5					10					15

(2) INFORMATION FOR SEQ ID NO:3:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 19 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS:
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

Asp	Ala	Leu	Thr	Asn	Ala	Val	Ala	His	Val	Asp	Asp	Met	Pro	Asn	Ala
1				5					10					15	

Leu Ser Ala

(2) INFORMATION FOR SEQ ID NO:4:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 10 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS:
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

Leu	Val	Val	Tyr	Pro	Trp	Thr	Gln	Arg	Phe
1			5					10	

(2) INFORMATION FOR SEQ ID NO:5:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 9 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS:
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

Leu Val Val Tyr Pro Trp Thr Gln Arg
1 5

(2) INFORMATION FOR SEQ ID NO:6:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 8 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS:
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

Leu Val Val Tyr Pro Trp Thr Gln
1 5

(2) INFORMATION FOR SEQ ID NO:7:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 7 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS:
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

Leu Val Val Tyr Pro Trp Thr
1 5

(2) INFORMATION FOR SEQ ID NO:8:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 6 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS:
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

Leu Val Val Tyr Pro Trp
1 5

(2) INFORMATION FOR SEQ ID NO:9:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 5 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS:
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

Leu Val Val Tyr Pro
1 5

(2) INFORMATION FOR SEQ ID NO:10:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 7 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS:
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

Val Val Tyr Pro Trp Thr Gln
1 5

(2) INFORMATION FOR SEQ ID NO:11:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 7 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS:
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

Tyr Pro Trp Thr Gln Arg Phe
1 5

(2) INFORMATION FOR SEQ ID NO:12:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 6 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS:
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

Tyr Pro Trp Thr Gln Arg
1 5

(2) INFORMATION FOR SEQ ID NO:13:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 5 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS:

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

Tyr Pro Trp Thr Gln
1 5

(2) INFORMATION FOR SEQ ID NO:14:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 6 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS:
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

Arg Met Trp Met Phe Arg
1 5

(2) INFORMATION FOR SEQ ID NO:15:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 423 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

GTGCTGTCTC CTGCCGACAA GACCAACGTC AAGGCCGCCT GGGGTAAGGT CGGCGCGCAC	60
GCTGGCGAGT ATGGTGCGGA GGCCCTGGAG AGGATGTTCC TGTCTTCCC CACCACCAAG	120
ACCTACTTCC CGCACTTCGA CCTGAGCCAC GGCTCTGCCC AGGTTAAGGG CCACGGCAAG	180
AAGGTGGCCG ACGCGCTGAC CAACGCCGTG GCGCACGTGG ACGACATGCC CAACGCGCTG	240
TCCGCCCTGA GCGACCTGCA CGCGCACAAG CTTCGGGTGG ACCCGGTCAA CTTCAAGCTC	300
CTAAGCCACT GCCTGTGGT GACCCTGGCC GCCACCTCC CCGCCGAGTT CACCCCTGCG	360
GTGCACGCTT CCCTGGACAA GTTCCTGGCT TCTGTGAGCA CCGTGCTGAC CTCCAAATAC	420
CGT	423

(2) INFORMATION FOR SEQ ID NO:16:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 141 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS:

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

Val	Leu	Ser	Pro	Ala	Asp	Lys	Thr	Asn	Val	Lys	Ala	Ala	Trp	Gly	Lys	
1				5				10						15		
Val	Gly	Ala	His	Ala	Gly	Glu	Tyr	Gly	Ala	Glu	Ala	Leu	Glu	Arg	Met	
			20					25					30			
Phe	Leu	Ser	Phe	Pro	Thr	Thr	Lys	Thr	Tyr	Phe	Pro	His	Phe	Asp	Leu	
		35					40					45				
Ser	His	Gly	Ser	Ala	Gln	Val	Lys	Gly	His	Gly	Lys	Lys	Val	Ala	Asp	
	50					55					60					
Ala	Leu	Thr	Asn	Ala	Val	Ala	His	Val	Asp	Asp	Met	Pro	Asn	Ala	Leu	
65					70				75						80	
Ser	Ala	Leu	Ser	Asp	Leu	His	Ala	His	Lys	Leu	Arg	Val	Asp	Pro	Val	
				85					90					95		
Asn	Phe	Lys	Leu	Leu	Ser	His	Cys	Leu	Leu	Val	Thr	Leu	Ala	Ala	His	
			100					105					110			
Leu	Pro	Ala	Glu	Phe	Thr	Pro	Ala	Val	His	Ala	Ser	Leu	Asp	Lys	Phe	
		115					120					125				
Leu	Ala	Ser	Val	Ser	Thr	Val	Leu	Thr	Ser	Lys	Tyr	Arg				
	130					135					140					

(2) INFORMATION FOR SEQ ID NO:17:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 438 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

GTGCACCTGA CTCCTGAGGA GAAGTCTGCC GTTACTGCCC TGTGGGGCAA GGTGAACGTG	60
GATGAAGTTG GTGGTGAGGC CCTGGGCAGG CTGCTGGTGG TCTACCTTTG GACCCAGAGG	120
TTCTTTGAGT CCTTTGGGGA TCTGTCCACT CCTGATGCTG TTATGGGCAA CCCTAAGGTG	180
AAGGCTCATG GCAAGAAAGT GCTCGGTGCC TTTAGTGATG GCCTGGCTCA CCTGGACAAC	240
CTCAAGGGCA CCTTTGCCAC ACTGAGTGAG CTGCACTGTG ACAAGCTGCA CGTGGATCCT	300
GAGAACTTCA GGCTGCTGGG CAACGTGCTG GTCTGTGTGC TGGCCCATCA CTTTGGCAAA	360
GAATTCACCC CACCAGTGCA GGCTGCCTAT CAGAAAGTGG TGGCTGGTGT GGCTAATGCC	420
CTGGCCCACA AGTATCAC	438

(2) INFORMATION FOR SEQ ID NO:18:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 146 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

```
Val His Leu Thr Pro Glu Glu Lys Ser Ala Val Thr Ala Leu Trp Gly
1          5          10          15
Lys Val Asn Val Asp Glu Val Gly Gly Glu Ala Leu Gly Arg Leu Leu
          20          25          30
Val Val Tyr Pro Trp Thr Gln Arg Phe Phe Glu Ser Phe Gly Asp Leu
          35          40          45
Ser Thr Pro Asp Ala Val Met Gly Asn Pro Lys Val Lys Ala His Gly
          50          55          60
Lys Lys Val Leu Gly Ala Phe Ser Asp Gly Leu Ala His Leu Asp Asn
65          70          75          80
Leu Lys Gly Thr Phe Ala Thr Leu Ser Glu Leu His Cys Asp Lys Leu
          85          90          95
His Val Asp Pro Glu Asn Phe Arg Leu Leu Gly Asn Val Leu Val Cys
          100          105          110
Val Leu Ala His His Phe Gly Lys Glu Phe Thr Pro Pro Val Gln Ala
          115          120          125
Ala Tyr Gln Lys Val Val Ala Gly Val Ala Asn Ala Leu Ala His Lys
          130          135          140
Tyr His
145
```

(2) INFORMATION FOR SEQ ID NO:19:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 141 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

```
Val Leu Ser Gly Glu Asp Lys Ser Asn Ile Lys Ala Ala Trp Gly Lys
1          5          10          15
```

Ile Gly Gly His Gly Ala Glu Tyr Gly Ala Glu Ala Leu Glu Arg Met
 20 25 30
 Phe Ala Ser Phe Pro Thr Thr Lys Thr Tyr Phe Pro His Phe Asp Val
 35 40 45
 Ser His Gly Ser Ala Gln Val Lys Gly His Gly Lys Lys Val Ala Asp
 50 55 60
 Ala Leu Ala Ser Ala Ala Gly His Leu Asp Asp Leu Pro Gly Ala Leu
 65 70 75 80
 Ser Ala Leu Ser Asp Leu His Ala His Lys Leu Arg Val Asp Pro Val
 85 90 95
 Asn Phe Lys Leu Leu Ser His Cys Leu Leu Val Thr Leu Ala Ser His
 100 105 110
 His Pro Ala Asp Phe Thr Pro Ala Val His Ala Ser Leu Asp Lys Phe
 115 120 125
 Leu Ala Ser Val Ser Thr Val Leu Thr Ser Lys Tyr Arg
 130 135 140

(2) INFORMATION FOR SEQ ID NO:20:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 146 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS:
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

Val His Leu Thr Asp Ala Glu Lys Ala Ala Val Ser Cys Leu Trp Gly
 1 5 10 15
 Lys Val Asn Ser Asp Glu Val Gly Gly Glu Ala Leu Gly Arg Leu Leu
 20 25 30
 Val Val Tyr Pro Trp Thr Gln Arg Tyr Phe Asp Ser Phe Gly Asp Leu
 35 40 45
 Ser Ser Ala Ser Ala Ile Met Gly Asn Ala Lys Val Lys Ala His Gly
 50 55 60
 Lys Lys Val Ile Thr Ala Phe Asn Asp Gly Leu Asn His Leu Asp Ser
 65 70 75 80
 Leu Lys Gly Thr Phe Ala Ser Leu Ser Glu Leu His Cys Asp Lys Leu
 85 90 95
 His Val Asp Pro Glu Asn Phe Arg Leu Leu Gly Asn Met Ile Val Ile
 100 105 110
 Val Leu Gly His His Leu Gly Lys Asp Phe Thr Pro Ala Ala Gln Ala
 115 120 125

Ala Phe Gln Lys Val Val Ala Gly Val Ala Thr Ala Leu Ala His Lys
 130 135 140
 Tyr His
 145

(2) INFORMATION FOR SEQ ID NO:21:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 141 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS:
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:21:

Val Leu Ser Ala Ala Asp Lys Ala Asn Val Lys Ala Ala Trp Gly Lys
 1 5 10 15
 Val Gly Gly Gln Ala Gly Ala His Gly Ala Glu Ala Leu Glu Arg Met
 20 25 30
 Phe Leu Gly Phe Pro Thr Thr Lys Thr Tyr Phe Pro His Phe Asn Leu
 35 40 45
 Ser His Gly Ser Asp Gln Val Lys Ala His Gly Gln Lys Val Ala Asp
 50 55 60
 Ala Leu Thr Lys Ala Val Gly His Leu Asp Asp Leu Pro Gly Ala Leu
 65 70 75 80
 Ser Ala Leu Ser Asp Leu His Ala His Lys Leu Arg Val Asp Pro Val
 85 90 95
 Asn Phe Lys Leu Leu Ser His Cys Leu Leu Val Thr Leu Ala Ala His
 100 105 110
 His Pro Asp Asp Phe Asn Pro Ser Val His Ala Ser Leu Asp Lys Phe
 115 120 125
 Leu Ala Asn Val Ser Thr Val Leu Thr Ser Lys Tyr Arg
 130 135 140

(2) INFORMATION FOR SEQ ID NO:22:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 146 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS:
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:22:

Val His Leu Ser Ala Glu Glu Lys Glu Ala Val Leu Gly Leu Trp Gly
 1 5 10 15

Lys Val Asn Val Asp Glu Val Gly Gly Glu Ala Leu Gly Arg Leu Leu
 20 25 30
 Val Val Tyr Pro Trp Thr Gln Arg Phe Phe Glu Ser Phe Gly Asp Leu
 35 40 45
 Ser Asn Ala Asp Ala Val Met Gly Asn Pro Lys Val Lys Ala His Gly
 50 55 60
 Lys Lys Val Leu Gln Ser Phe Ser Asp Gly Leu Lys His Leu Asp Asn
 65 70 75 80
 Leu Lys Gly Thr Phe Ala Lys Leu Ser Glu Leu His Cys Asp Gln Leu
 85 90 95
 His Val Asp Pro Glu Asn Phe Arg Leu Leu Gly Asn Val Ile Val Val
 100 105 110
 Val Leu Ala Arg Arg Leu Gly His Asp Phe Asn Pro Asp Val Gln Ala
 115 120 125
 Ala Phe Gln Lys Val Val Ala Gly Val Ala Asn Ala Leu Ala His Lys
 130 135 140
 Tyr His
 145

(2) INFORMATION FOR SEQ ID NO:23:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 23 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS:
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:23:

Val His Leu Ser Ala Glu Glu Lys Glu Ala Val Leu Gly Leu Trp Gly
 1 5 10 15
 Lys Val Asn Val Asp Glu Val
 20

(2) INFORMATION FOR SEQ ID NO:24:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 20 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS:
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:24:

Val Leu Ser Ala Ala Asp Lys Ala Asn Val Lys Ala Ala Trp Gly Lys
 1 5 10 15

Val Gly Gly Gln
 20

(2) INFORMATION FOR SEQ ID NO:25:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 14 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS:
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:25:

Phe Pro His Phe Asn Leu Ser His Gly Ser Asp Gln Val Lys
 1 5 10

(2) INFORMATION FOR SEQ ID NO:26:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 8 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS:
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:26:

Val Val Tyr Pro Trp Thr Gln Arg
 1 5

(2) INFORMATION FOR SEQ ID NO:27:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 4 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS:
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:27:

Tyr Pro Trp Thr
 1

(2) INFORMATION FOR SEQ ID NO:28:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 4 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS:

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:28:

Gly Tyr Pro Tyr
1

(2) INFORMATION FOR SEQ ID NO:29:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 4 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS:
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:29:

Gly Lys Pro Tyr
1

(2) INFORMATION FOR SEQ ID NO:30:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 4 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS:
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:30:

Gly Leu Pro Tyr
1

(2) INFORMATION FOR SEQ ID NO:31:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 6 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS:
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:31:

Lys Met Trp Met Phe Arg
1 5

(2) INFORMATION FOR SEQ ID NO:32:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 8 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS:
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:32:

Val Arg Arg Met Phe Gly Gly Tyr
1 5

(2) INFORMATION FOR SEQ ID NO:33:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 6 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:33:

Phe Leu Gly Phe Pro Thr
1 5

(2) INFORMATION FOR SEQ ID NO:34:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 6 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 1
- (D) OTHER INFORMATION: /product= "position 1"
/label= Xaa
/note= "pyroGln"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:34:

Xaa Gln Gln Asp Cys Lys
1 5

(2) INFORMATION FOR SEQ ID NO:35:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 4 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 1
- (D) OTHER INFORMATION: /product= "position 1"
/label= Xaa
/note= "N-AcetylSer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:35:

Xaa Asp Lys Pro
1

(2) INFORMATION FOR SEQ ID NO:36:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 13 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 1
- (D) OTHER INFORMATION: /product= "position 1"
/label= Xaa
/note= "biotin-Phe"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:36:

Xaa Pro His Phe Asp Leu Ser His Gly Ser Ala Gln Val
1 5 10

(2) INFORMATION FOR SEQ ID NO:37:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 13 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 1
- (D) OTHER INFORMATION: /product= "position 1"
/label= Xaa
/note= "iodo-Phe"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:37:

Xaa Pro His Phe Asp Leu Ser His Gly Ser Ala Gln Val
1 5 10

(2) INFORMATION FOR SEQ ID NO:38:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 13 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 4
- (D) OTHER INFORMATION: /product= "position 4"
/label= Xaa
/note= "iodo-Phe"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:38:

Phe	Pro	His	Xaa	Asp	Leu	Ser	His	Gly	Ser	Ala	Gln	Val
1				5					10			

(2) INFORMATION FOR SEQ ID NO:39:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 13 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 1
- (D) OTHER INFORMATION: /product= "position 1"
/label= Xaa
/note= "iodo-Phe"

(ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 4
- (D) OTHER INFORMATION: /product= "position 4"
/label= Xaa
/note= "iodo-Phe"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:39:

Xaa	Pro	His	Xaa	Asp	Leu	Ser	His	Gly	Ser	Ala	Gln	Val
1				5					10			